

First record of an immature green turtle *Chelonia mydas* (Linnaeus, 1758) (Testudines: Cheloniidae) on a fluvial island, Reserva Biológica do Parazinho, Amazonas river, Brazil

Carlos Eduardo Costa Campos^{1*}, Rafael Cabral dos Santos², Ananda Silva Araújo³ and Núcia Nayara Guedes Paes³

1 Universidade Federal do Amapá, Departamento de Ciências Biológicas e da Saúde, Laboratório de Zoologia. Rodovia Juscelino Kubitschek, km 02, Jardim Marco Zero. CEP 68902-280. Macapá, AP, Brazil.

2 Secretaria Estadual do Meio Ambiente do Estado do Amapá. Avenida Mendonça Furtado, 53. CEP 68900-060. Macapá, AP, Brazil.

3 Bolsista de Iniciação Científica PIBIC/CNPq. Rodovia Juscelino Kubitschek, km 02, Jardim Marco Zero. CEP 68902-280. Macapá, AP, Brazil.

* Corresponding author. E-mail: eduardocampos@unifap.br

ABSTRACT: On March 8th, 2011 we recorded an immature green turtle *Chelonia mydas* at the Reserva Biológica do Parazinho, eastern Amazonia, Brazil. This record of *C. mydas* on a fluvial island, where the aquatic environment is a mixture of fresh and salt water, suggests that this typical marine species potentially tolerates lower levels of water salinity.

Green sea turtles *Chelonia mydas* (Linnaeus, 1758) are found circumglobally in the tropics (Pritchard 1996), are highly migratory (Hirth 1997), and forage in mixed aggregations drawn from various rookeries or nesting beaches (Luke *et al.* 2004; Bass *et al.* 2006). The carapace has various color patterns that change over time, but hatchlings have mostly black carapaces and light-colored plastrons. Carapaces of juveniles turn dark brown to olive, while those of mature adults are entirely brown, spotted, or marbled with variegated rays. Adult plastron is hued yellow (Marquez 1990). Currently, the conservation status of *C. mydas* is “endangered” because of population reduction levels (Peres *et al.* 2011; IUCN 2012).

On March 8th, 2011 we observed an immature green turtle in the Reserva Biológica do Parazinho (Figure 1). The specimen had total length of 42.5 cm and was stranded live near creeks in low tide. The specimen was photographed and released. This is the first record of *Chelonia mydas* on a fluvial island. It was an opportunistic record during field activities in the project “Reproductive biology of *Podocnemis expansa* (Podocnemididae)”, under the authorization number 03/2010 from the Secretaria Estadual do Meio Ambiente do Amapá.

The Reserva Biológica do Parazinho (00°52'30" N, 49°59'15" W) is a strictly protected area (biological reserve, as defined by the Brazilian environmental laws; see Rylands and Brandon 2005) and it is part of the archipelago Bailique, in the municipality of Macapá, state of Amapá (Figure 2). Flat areas with clay, silt, and sand, with both river and sea origins, characterize the relief. As the humidity is under constant influence from the Amazonas river and the Atlantic ocean, it has marine and resting formations features subject to periodic flooding, as well as a constant load of sediment (Santos *et al.* 2004; Drummond *et al.* 2008).

Reproductive areas of *Chelonia mydas* in Brazil are usually restricted to oceanic islands, such as Trindade

(Moreira *et al.* 1995), Atol das Rocas (Bellini *et al.* 1996; Grossman *et al.* 2007) and Fernando de Noronha (Bellini and Sanches 1996). In addition, minor spawning areas also occur on the northern coast of Bahia state and occasionally in Espírito Santo, Sergipe and Rio Grande do Norte states (Almeida *et al.* 2011). Non-reproductive records of sea turtles (juveniles, sub-adults and adults) refer to occurrences not recorded during the reproductive seasons. In general, these records include dead specimens found on the beaches, and turtles caught in fishing traps (gill netting; see Marcovaldi and Marcovaldi 1999; Salet *et al.* 2008). The non-reproductive records of turtles, especially of juveniles, usually occur in the continental coast and oceanic island (Sales *et al.* 2007, Proietti *et al.* 2009). This record of *C. mydas* on a fluvial island, where the aquatic environment is a mixture of fresh and salt water, suggest that this typical marine species potentially tolerates lower levels of water salinity than previously



FIGURE 1. Juvenile *Chelonia mydas* recorded in March 2011, out of the reproductive season, at Reserva Biológica do Parazinho, Amazonas river, municipality of Macapá, state of Amapá, eastern Amazonia, Brazil. Photo by Rafael Cabral dos Santos.

thought (Hirth 1997). We did not test such hypothesis, but if confirmed, this tolerance could allow migrations among populations through coastal routes, including estuarine areas (Naro-Maciel *et al.* 2007). If so, *C. mydas* could migrate without going offshore to overcome these less-salty estuarine areas (Hirth 1997).

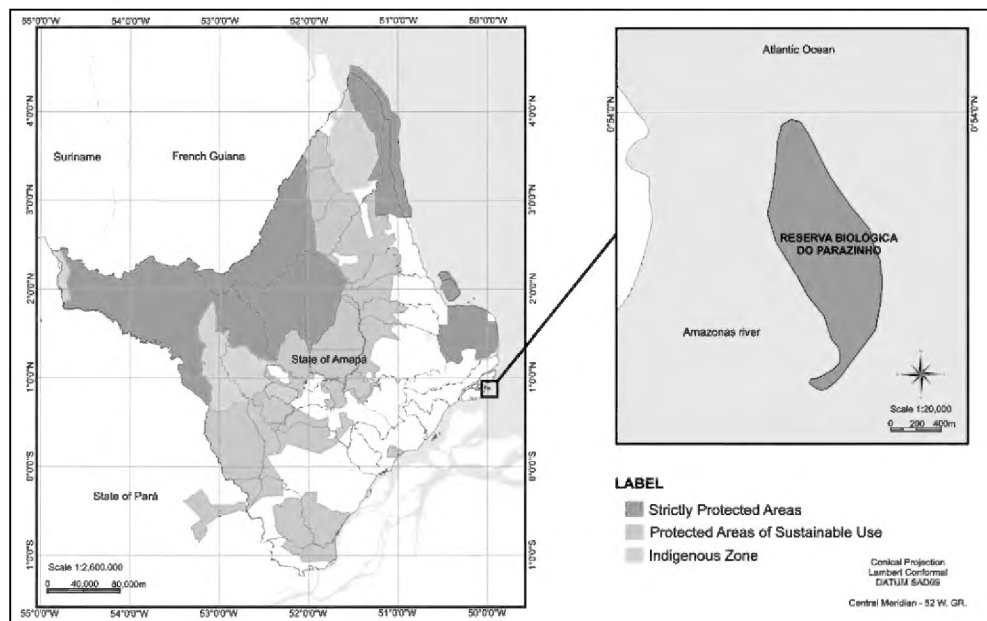


FIGURE 2. Localization of the Reserva Biológica do Parazinho, eastern Amazonia, Brazil, after Drummond *et al.* (2008).

ACKNOWLEDGMENTS: The authors wish to thank Armando Santos and Cláudio Bellini for confirming the species identification. We thank Marcelo Nogueira de Carvalho Kokubum, Sebastian Steinfartz, Guth Berger Falcon Rodrigues and one anonymous referee for their comments on a previous draft of the manuscript. Huann Vasconcelos for preparing the map. Universidade Federal of Amapá and Secretaria Estadual do Meio Ambiente do Amapá for logistic support.

LITERATURE CITED

- Almeida, A.P., A.J.B.S. Santos, J.C.A. Thomé, C. Belini, C. Baptistotte, M.Â. Marcovaldi, A.S. Santos and M. Lopez. 2011. Avaliação do Estado de Conservação da Tartaruga Marinha *Chelonia mydas* (Linnaeus, 1758) no Brasil. *Biodiversidade Brasileira* 1:12-19.
- Bass, A.L., S.P. Epperly and J. Braun-McNeill. 2006. Green turtle (*Chelonia mydas*) foraging and nesting aggregations in the Caribbean and Atlantic: impact of currents and behavior on dispersal. *Journal of Heredity* 97(4):346-354.
- Bellini, C. and T.M. Sanches 1996. Reproduction and feeding of marine turtles in the Fernando de Noronha Archipelago, Brazil. *Marine Turtle Newsletter* 74:12-13.
- Bellini, C., M.Â. Marcovaldi, T.M. Sanches, A. Grossman and G. Sales. 1996. Atol das Rocas Biological Reserve: second largest *Chelonia rookery* in Brazil. *Marine Turtle Newsletter* 72: 1-2.
- Drummond, J.A., T.C.A. Dias and D.M.C. Brito. 2008. *Atlas das Unidades de conservação do Estado do Amapá*. Macapá: MMA/IBAMA/GEA/SEMA, CD-ROM.
- Grossman, A., P. Mendonça, M.R. Costa and C. Bellini. 2007. Morphometrics of the Green Turtle at the Atol das Rocas Marine Biological Reserve, Brazil. *Marine Turtle Newsletters* 118: 12-13.
- Hirth, H.F. 1997. Synopsis of the biological data on the green turtle *Chelonia mydas* (Linnaeus 1758). *Biological Report* 97(1): 1-129.
- IUCN 2012. *IUCN Red List of Threatened Species. Version 2012.1*. Electronic Database accessible at <http://www.iucnredlist.org/>. Captured on 29 October 2011.
- Luke, K., J.A. Horrocks, R.A. Le Roux and P.H. Dutton. 2004. Origins of green turtle (*Chelonia mydas*) feeding aggregations around Barbados, West Indies. *Marine Biology* 144: 799-805.
- Marcovaldi, M.Â. and G. Marcovaldi. 1999. Marine turtles of Brazil: the history and structure of Projeto TAMAR-IBAMA. *Biological Conservation* 91: 35-41.
- Márquez, R.M. 1990. FAO species catalogue: *Sea turtles of the world. An annotated and illustrated catalogue of sea turtle species known to date*. FAO Fisheries Synopsis. 81 p.
- Moreira, L.M.P., C. Baptistotte, J. Scalfoni, J.C. Thomé and A.P.L.S. Almeida. 1995. Occurrence of *Chelonia mydas* on the island of Trindade, Brazil. *Marine Turtle Newsletter* 70: 2.
- Naro-Maciel, E., J.H. Becker, H.S.M. Lima, M.A. Marcovaldi and R. Desalle. 2007. Testing dispersal hypotheses in foraging green sea turtles (*Chelonia mydas*) of Brazil. *Journal of Heredity* 98(1): 29-39.
- Pritchard, P.C.H. 1996. Evolution, phylogeny and status; p. 1-28 In P.L. Lutz and J.A. Musick (ed.). *The Biology of Sea Turtles*. Florida, Boca Raton: CRC Press.
- Peres, M.B., B.F.S. Dias and U.E. Vercillo. 2011. Avaliação do estado de conservação da fauna brasileira e a lista de espécies ameaçadas: O que significa? Qual sua importância? Como fazer? *Biodiversidade Brasileira* 1:45-48.
- Proietti, M.C., P. Lara-Ruiz, J.W. Reisser, L.S. Pinto, O.A. Dellagostin. and L.F. Marins. 2009. Green turtles (*Chelonia mydas*) foraging at Arvoredo Island in Southern Brazil: Genetic characterization and mixed stock analysis through mtDNA control region haplotypes. *Genetics and Molecular Biology* 32(3): 613-618.
- Rylands, A.B. and K. Brandon. 2005. Brazilian protected areas. *Conservation Biology* 19(3): 612-618.
- Sales, G., B.B. Giffoni and P.C.R. Barata. 2008. Incidental catch of sea turtles by the Brazilian pelagic longline fishery. *Journal of the Marine Biological Association of the United Kingdom* 88(4): 853-864.
- Santos, V.F., A.C.S. Andrade, O.F.M. Silveira, M.H.A. Martins and F.P. Carvalho. 2004. Dinâmica Geomorfológica; p. 46-61 In V.F. Santos (ed.). *Diagnostico Sócio Ambiental Participativo do Setor Estuarino do Estado do Amapá*. Macapá: MMA/GEA/IEPA.

RECEIVED: December 2011

ACCEPTED: January 2013

PUBLISHED ONLINE: May 2013

EDITORIAL RESPONSIBILITY: Davi L. Pantoja